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**DEFENSE INFORMATION INFRASTRUCTURE (DII)**

**COMMON OPERATING ENVIRONMENT (COE)**

**DISTRIBUTED COMPUTING ENVIRONMENT SERVER (DCES)**

**Segment v1.0.0.1**

**Installation Instructions for HP-UX 10.20**

**May 13, 1997**

Distribution limit to DII installations and those specified in specific international agreements. Other request for this document must be referred to the Program Manager, DII , 45335 Vintage Park Plaza, Sterling, Virginia 20166-6701.

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## **Purpose**

These instructions describe how to install and configure the Distributed Computing Environment Server (DCES) segment on a HP-UX machine.

## **References**

- HP DCE/9000 Version 1.5 for HP-UX 10.20 Release Notes
- Planning and Configuring HP DCE
- HP DCE Command Reference
- OSF DCE Administration Guide: Core Components
- DII COE DCE Cell Administration Guide

## **Tested Platform and Environment**

Logicon developed and tested the DCES segment in the following hardware and software environment.

- HP/9000 715 Workstation "scotty"
- HP-UX Operating System version 10.20
- DII COE Kernel version 3.0.1.0 HP-UX 10.20, material date 04/14/97
- DII COE Developers Toolkit version 3.0.1.0 HP-UX 10.20, material date 04/14/97
- HP DCE 1.5 for HP-UX 10.20

Furthermore, the HP DCES segment was configured using one other machine with the following hardware, software, and DCE cell structure.

- Sun SPARCstation 20 "spock"
- Solaris 2.5.1 Operating System
- DII COE Kernel version 3.0.0.3 for Solaris 2.5.1, material date 10/15/96
- DII DCE Server (DCES) segment version 1.0.0.5 for Solaris 2.5.1, material date 12/09/96
- "spock" was configured as a Cell Directory Server (CDS), Security Server, and local Distributed Time Server (DTS).

## **Machine Requirements**

- Total memory required to run HP DCE 1.5 is a minimum 32 Mb of memory for DCE client-only machines; 64 Mb for DCE server machines.
- A minimum of 50 Mb of swap space is recommended for DCE client-only HP DCE 1.5 systems; at least 100 Mb is recommended for systems running one or more DCE servers.

## Configuring the DCE Segment

When creating an HP DCE cell, servers must be configured before clients. First configure a Security server, then a CDS server, Time servers, and finally a single Time provider. Then you may configure clients.

When planning a DCE cell, note that you must configure a CDS client on any Security server system that is not running a CDS server. You must also configure a Time client on any system that is not running a Time server. Be sure to configure these clients only after you have configured all servers.

1. From the SYSADMIN Menu Bar choose <Network> | <DCE> | <Configure DCE Servers>. Enter the root password if prompted. Choose CONFIGURE from the DCE Main Menu.

DCE Main Menu (on hostname)

selection: 1 (CONFIGURE)

DCE Configuration Menu (on hostname)

1. Initial Cell Configuration
2. Additional Server Configuration
3. DCE Client
4. DFS Client

98.Return to previous menu

99.Exit

selection:

2. From the DCE Configuration Menu, choose Initial Cell Configuration:

DCE Configuration Menu (on hostname)

selection: 1 (Initial Cell Configuration)

S: \* \* \* \* \* Configuring initial cell.

Initial Cell Configuration (on hostname)

1. Initial Security Server
2. Initial CDS Server
3. Initial DTS Server

98.Return to previous menu

99.Exit

selection:

- 3 Configure the Security Server:

Initial Cell Configuration

selection: **1** (Security Server)

S: \* \* \* \* \* Configuring initial Security Server

- 4 If this is your very first cell configuration, or if you have previously run REMOVE, answer **n** to the following question. If you are reconfiguring a cell, answer **y**:

Do you want to first remove all remnants of previous DCE configurations for all configurations for all components (y/n)? You should do so only if you plan on reconfiguring all existing DCE components now: (n)

- 5 Enter a cell name:

Enter the name of your cell (without /...), xyz.abc.com

S: \* \* \* \* \* Stopping rpcd...

S: \* \* \* \* \* Starting dced...

S: \* \* \* \* \* Initializing dced...

S: \* \* \* \* \* Since the glbd daemon was restarted and/or llbd and rpcd were replaced by the endpoint mapper, NCS applications may need to be restarted.

- 6 At the following prompt, enter any string and press <RETURN>.

Enter keyseed for initial database master key:

- 7 **dce\_config** prompts you to choose the Cell Administrator's principal name and password. The default principal name for the Cell Administrator is **cell\_admin**:

Enter desired principal name for the Cell Administrator: (cell\_admin)

Enter desired password for the Cell Administrator

- 8 **dce\_config** prompts you for the starting point for UNIX user and group Ids that will be generated by the DCE Security Service. This step prevents the DCE Security Service from generating Ids that are already in use by your system. Type <RETURN> to choose the default value, or enter a value of your choice:

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S: \* \* \* \* \* The current highest UNIX ID for persons is *N*. Enter the starting point to be used for UNIX IDs that are automatically generated by the Security Service when a principal is added using "rgy\_edit ": (*N+100*) <RETURN>

S: \* \* \* \* \* The current highest UNIX ID for groups is *N*. Enter the starting point to be used for UNIX IDs that are automatically generated by the Security Service when a group is added using "rgy\_edit ": (*N+100*) <RETURN>

**dce\_config** then starts up **secd** and initializes the registry database.

S: \* \* \* \* \* Starting secd...

S: \* \* \* \* \* Checking for active sec\_client service...

S: \* \* \* \* \* Starting sec\_client service...

S: \* \* \* \* \* Initializing the registry database...

This system is now configured as the master Security Server. You must now create a CDS server, either on this system or on another system:

- If the CDS server for this cell will be on another system, repeat steps 1 and 2 on that system, and continue with step 10 below.
- If the CDS server is on the same system as the Security server, continue with step 9 below.

9 From the initial Cell Configuration menu, choose Initial CDS Server:

selection: **2** (Initial CDS Server)

Initial Cell Configuration (on *hostname*)

This routine starts up **cdsadv** and **cdsd**, initializes the name space, and sets ACLs for all new name space entries.

S: \* \* \* \* \* Configuring initial CDS server...

S: \* \* \* \* \* Please wait for user authentication and authorization...

S: \* \* \* \* \* Checking for active sec\_client service...

10 **dce\_config** asks whether it should create a LAN profile for use in dividing clients and servers into profile groups for higher performance in multi-LAN cells. If you choose to have a LAN profile created, **dce\_config** asks for the name of the local LAN> The name you provide is arbitrary, and is used by **dce\_config** to store LAN profile information .

Create LAN profile so clients and servers can be divided into profile groups for higher performance in a multi-lan cell? (n) **y**

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What is the name of the LAN? **lan\_250**

```
S: * * * * * Starting cdsadv...
S: * * * * * Starting CDSD...
S: * * * * * Creating LAN profile...
S: * * * * * Setting ACLs for all new namespace entries...
```

This system is now configured as a CDS server. You must now create a DTS server, either on this system or on another system.

Time servers should be configured in any cell of more than one system. A minimum of three Time servers is recommended for any cell with three or more member systems. See the *OSF DCE Administration Guide -- Core Services* for a discussion of the optimum placement of servers in a cell with gateway or WAN links. DTS servers may be configured on any system in the cell.

When **dce\_config** is first run on a system, the HP-UX environment variable TZ is read to determine the HP-UX local time zone. **dce\_config** then automatically selects a matching DCE local time zone and creates the link for **/etc/opt/dce/zoneinfo/localtime**. A different time zone can be chosen: see the **localtime(5)** man page for details.

To configure a DTS server on this system, or on another system:

- If the DTS server for this cell will be on another system, repeat steps 1 and 2 on that system, and continue with step 11 below.
- If the DTS server will be on this system, continue with step 11 below.

11 From the Initial Cell Configuration menu, choose Initial DTS Server:

selection: **3**

```
S: * * * * * Configuring initial DTS services
S: * * * * * Please wait for user authentication and authorization...
S: * * * * * Checking for active sec_client service...
```

DTS Configuration Menu

1. DTS Local Server
2. DTS Global Server (only in multi-LAN cells.)
3. DTS Clerk
4. DTS Time Provider

98.Return to previous menu

99.Exit

selection:

12 For servers on the same LAN, select the DTS Local Server:

selection: **1** (DTS Local Server)

For a discussion about the use of DTS global servers for time servers communicating between LANs, see the *OSF DCE Administration Guide*. Where appropriate, select the DTS global server:

selection: **2** (DTS Global Server)

Either selection starts the **dts** daemon (**dtstd**).

13 Configure a DTS time provider on one of the time servers in a cell.

The DTS **null** time provider configures a system to trust its own clock as an accurate source of time. The DTS **ntp** provider obtains an accurate source of time from some other system outside the cell. The **spectracom** time provider uses a local hardware device as a time provider. See the *OSF DCE Administration Guide* for more information on time providers.

14 Select the DTS Time Provider:

selection: **4** (DTS Time Provider)

The following menu is displayed:

DTS Time Provider Menu

1. Configure a NULL time provider
2. Configure a NTP time provider
3. Configure a Spectracom time provider

98.Return to previous menu

99.Exit

selection:

15 Select NULL or NTP or SPECTRACOM:

selection: **1** (NULL time provider)

or

selection: **2** (NTP time provider)

*or*

selection: **3** (spectracom time provider)

If you select the NTP time provider, the following prompt appears:

Enter the host name where the NTP server is running:

If you select the spectracom time provider, the following prompt appears:

Enter the device name where the TP is connected:

You have now completed configuration of the server systems.

## Configuring Additional CDS Servers

Follow this procedure if you want to configure additional CDS servers:

- 1 From the SYSADMIN Menu Bar choose <Network> | <DCE> | <Configure DCE Servers>. Enter the root password if prompted. From the DCE Configuration Menu, choose Additional Server Configuration:

DCE Configuration Menu (on hostname)

selection: **2**

S: \* \* \* \* \* Configuring additional server.

S: \* \* \* \* \* Please wait for user authentication and authorization.

### Note:

When configuring a multi-system cell, **dce\_config** checks that system times are within 120 seconds of each other.

- 2 The Additional Server Configuration menu appears. Choose Additional CDS Server:

Additional Server Configuration Menu

selection: **1** (Additional DCS Server(s))

S: \* \* \* \* \* Configuring additional CDS server

A CDS server must have already been configured.

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- 3 **dce\_config** prompts for the name of an existing CDS server. If the cell has more than one CDS server, choose one:

What is the name of a CDS server in this cell (if there is more than one, enter the name of the server to be cached if necessary)?

**cds\_server\_node**

S: \* \* \* \* \* Checking for active sec\_client service...

S: \* \* \* \* \* Starting cdsadv...

- 4 **dce\_config** asks whether it should create a LAN profile for use in dividing clients and servers into profile groups for higher performance in multi-LAN cells. If you choose to have a LAN profile created, **dce\_config** asks for the name of the local LAN. The name you provide is arbitrary, and is used by **dce\_config** to store LAN profile information.

Create LAN profile so clients and servers can be divided into profile groups for higher performance in a multi-lan cell? (n) **n**

S: \* \* \* \* \* Starting cdsd...

S: \* \* \* \* \* Waiting for registry propagation...

S: \* \* \* \* \* Initializing the name space for additional CDS server...  
Modifying ACLs on /./:/hosts/hostname/cds-server

- 5 After starting the CDS client daemon, **dce\_config** prompts for the name of the CDS clearinghouse. Enter a name of your choice.

What is the name for this clearinghouse? **hostname\_ch**

S: \* \* \* \* \* Modifying ACLs on /./:/host\_ch...

- 6 **dce\_config** asks if more directories should be replicated. If you answer **y**, **dce\_config** prompts for a list of directories to be replicated:

Should more directories be replicated? (n) **y**

Enter a list of directories to be replicated, separated by spaces, and terminated by <RETURN>

### Notes on Configuring Additional CDS Servers

Immediately after configuring an additional CDS server, you should, while logged in as **cell\_admin**, skulk the root directory using the following command:

```
dcecp -c directory synchronize /./:
```

This will initiate the propagation of a consistent copy of the changed root directory information to all the CDS servers, and will prevent problems which might arise from use of inconsistent information before this propagation. The use of several CDS servers may increase the time required to complete the propagation of this information.

## Configuring Client Systems

Before configuring clients, first configure your server systems. Then use this procedure to configure client systems.

You must configure a CDS client on any Security server system that is not running a CDS server. To configure a client system, you need to know the name of the system(s) running the Security server and the initial CDS server for the cell.

If you are using DTS as your time synchronization mechanism, you must configure a DTS clerk (client) on any system that is not running a DTS server.

You must have the following information to configure a client:

- The host name of any security server in the cell
- The cell administrator's principal name and password
- The host name of a CDS server in the cell

1 From the SYSADMIN Menu Bar choose <Network> | <DCE> | <Configure DCE Servers>. Enter the root password if prompted.

2 Enter the DCE Configuration Menu:

DCE Main Menu

selection: **1** (CONFIGURE)

3 Run the client configuration routine:

DCE Configuration Menu

selection: **3** (DCE Client)

4 **dce\_config** asks if you want to remove all remnants of previous DCE configurations. If you are configuring this system for the first time or have previously run Remove, answer **n**. Otherwise, answer **y**.

5 Enter the host name of your cell's security server:

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What is the name of a Security Server running in the cell you wish to join? **sec\_server\_node**

S: \* \* \* \* \* Starting dced...  
S: \* \* \* \* \* Initializing dced...

- 6 After starting and initializing the Security client daemon, **dce\_config** asks for the name of a node with which it can synchronize the clock on this node: Enter **<RETURN>** to get the default (the master security machine in the cell).

Enter a machine to synchronize with: (sec\_server\_node) **<RETURN>**  
Time on host is within specified tolerance (120 secs) of time on sec\_server\_node.

S: \* \* \* \* \* Checking for active sec\_client service...  
S: \* \* \* \* \* Starting sec\_client service...  
S: \* \* \* \* \* This node is now a security client.  
S: \* \* \* \* \* Starting cdsadv...

- 7 Enter the name of the cell CDS server. If the cell has more than one CDS server, choose one:

What is the name of a CDS server in this cell (if there is more than one, enter the name of the server to be cached if necessary)?  
**cds\_server\_host**

Create LAN profile so clients and servers can be divided into profile groups for higher performance in a multi-lan cell? (n) **n**

S: \* \* \* \* \* This node is now a CDS client.

- 8 After configuring the CDS client, **dce\_config** asks how the node should be configured for DTS. If you are using DTS as your time synchronization mechanism, you must configure a DTS clerk (client) on any system that is not running a DTS server.

Should this machine be configured as a DTS Clerk, DTS Local Server, or DTS Global Server? (default is DTS Clerk) (clerk, local, global, none) **<RETURN>**

S: \* \* \* \* \* Starting dtسد...  
S: \* \* \* \* \* This node is now a DTS clerk

Configuration of the DCE client system is now complete.

## Configuring GDA Servers

The DCE Global Directory Agent (GDA) facilitates communication between DCE cells. This section describes how to start the GDA server.

- 1 Start **dce\_config** on the GDA server system.
- 2 From the DCE Configuration Menu, choose Additional Server Configuration:

selection: **2** (Additional Server Configuration)

- 3 Choose GDA Server:

selection: **7** (GDA Server)

The system configures the GDA server and starts the GDA server daemon, **gdad**.

## Creating a Security Server Replica

A feature of HP DCE/9000 is Security Server Replication, which provides for improved cell performance and reliability. These steps will allow you to create a security replica via **dce\_config**.

- 1 From the DCE Configuration Menu:

DCE Configuration Menu

selection: **2** (Additional Server Configuration)

- 2 From the Additional Server Configuration Menu, choose Replica Security Server:

Additional Server Configuration (on hostname)

selection: **8** (Replica Security Server)

S: \* \* \* \* \* Configuring Security Replication

- 3 **dce\_config** prompts for a name for the security replica. Enter whatever name you wish:

Enter the Security Replica name (without subsys/dce/sec): **sec\_rep\_node**

S: \* \* \* \* \* Modifying acls on /./sec/replist...

S: \* \* \* \* \* Modifying acls on /./subsys/dce/sec...

S: \* \* \* \* \* Modifying acls on /./sec...

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```
S: * * * * * Modifying acls on /.: ...  
S: * * * * * Modifying acls on /.:/cell-profile...
```

- 4 **dce\_config** prompts for a key seed; enter any sequence of characters:

Enter keyseed for initial database master key: **jdp98m//7**

```
S: * * * * * starting slave security server (secd)...
```

The default name for the replica is **subsys/dce/sec/\$HOSTNAME**. If you want to change the name of the security replica that is created by **dce\_config**, change the value of **SEC\_REPLICA**, either in **/etc/opt/dce/dce\_com\_env**, or in the shell environment from which **dce\_config** is run. Note that you must do this *before* running **dce\_config**.

### De-Installation of DCES for HP-UX 10.20

After de-installing the DCES segment using the COE Installer perform the following steps

- 1 Change “su” to root.
- 2 Type **/etc/dce\_config**
- 3 If this machine is configured as the Master Security Server, select REMOVE, otherwise select UNCONFIGURE
- 4 Exit dce\_config by selecting “99”
- 5 Type **/usr/sbin/swremove B2920A\_APZ**

De-installation of the DCES segment is now complete.

## Useful Commands to Validate HP DCE Configuration

### The dce\_login command

The **dce\_login** command validates a principal's identity and obtains the principal's network credentials.

```
# dce_login cell_admin
Enter Password:
```

### The dcecp dts show Command

The following command was executed on a DTS client machine. It provides valuable information, such as when the last time the client synchronized, last time polled, with a DTS server.

```
# dcecp -c dts show
{tolerance +0-00:05:00.000I-----}
{tdf -0-05:00:00.000I-----}
{maxinaccuracy +0-00:00:00.100I-----}
{minservers 1}
{queryattempts 3}
{localtimeout +0-00:00:05.000I-----}
{globaltimeout +0-00:00:15.000I-----}
{syncinterval +0-00:10:00.000I-----}
{type clerk}
{clockadjrate 40000000 nsec/sec}
{maxdriftrate 1000000 nsec/sec}
{clockresolution 10000000 nsec}
{version V1.0.1}
{timerep V1.0.0}
{autotdfchange no}
{nexttdfchange 1997-04-06-03:00:00.000-04:00I0.000}
{status enabled}
{localservers
  {name ../../gccs.smil.mil/hosts/spock/self}
  {timelastpolled 1997-01-15-10:20:10.402-05:00I-----}
  {lastobstime 1997-01-15-10:20:10.311-05:00I-----}
  {lastobsskew +0-00:00:00.091I-----}
  {inlastsync TRUE}
  {transport RPC}}
```

### The dcecp cell ping Command

The **cell ping** command performs a quick check to test if the cell is running. If no options are given the command pings the master security server, any CDS servers that house a master directory replica and all DTS servers.

```
# dcecp -c cell ping
DCE services available
```

The **-replicas** option will cause the command to ping each security and CDS server, both master and replica, as well as all DTS servers.

```
# dcecp -c cell ping -replicas
DCE servers available
```

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The **-clients** option will cause the command to ping every machine in the cell.

```
# dcecp -c cell ping -clients
DCE clients available
```

### The dcecp cell show Command

The **cell show** command returns attributes describing the configuration of the specified cell. In the following example, we have two machines in the cell. *Spock* is the master security server, a CDS server and DTS server. *Scotty* is a DCE client-only machine.

```
# dcecp -c cell show
{secservers
/.../gccs.smil.mil/subsys/dce/sec/master}
{cdsservers
/.../gccs.smil.mil/hosts/spock}
{dtsservers
/.../gccs.smil.mil/hosts/spock}
{hosts
/.../gccs.smil.mil/hosts/spock
/.../gccs.smil.mil/hosts/scotty}
```